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Specimen Handling

- 3a. Identify steps in specimen collection, preparation, and preservation.

Specimen Handling

- Patient Preparation
 - Approaching Patient
 - Patient ID
 - Verbally if outpatient
 - Check armband for inpatients
 - Explain who you are
 - Provide assurance
 - Position Patient
 - Comfort and safety
 - Assemble Supplies
 - Select vein
 - Perform venipuncture
- Blood anticoagulants
 - Chelating agents-work by binding calcium
 - EDTA-Hematology
 - Sodium Fluoride-Glucose and Blood alcohol testing
 - Sodium citrate
 - Oxalates

Specimen Handling



- Heparin-anticoagulant of choice when plasma is required for chemistry analysis
 - interferes least with chemical analysis
 - prevents formation of thrombin
 - used for collection of blood gas specimens

Specimen Handling

- Urine preservatives
 - Normally used in 24 hour collection
 - Type of preservative used depends on substance being tested
 - Boric acid
 - Formalin
 - Hydrochloric acid
 - Toluene
 - Warning labels and patients



Specimen Handling



- Centrifugation
 - Way of separating the liquid portion of blood from formed cellular elements
 - Must clot 10-15 min
 - 5-10 min @3000 rpm
 - Balance
 - Always spin in original container

Specimen Handling

- Acceptable/Unacceptable specimens
 - Volume
 - Min. vol required for accurate determinations
 - Anticoagulants-must not interfere with procedures
 - Lipemia-increases absorbance in spec.
 - Hemolysis-erroneous results
 - Labeling
- Timed samples
 - Blood gases must be collected and placed on wet ice and be analyzed in 15 min.
 - Cortisol levels should be properly collected and labeled for AM and PM specimens

Specimen Handling



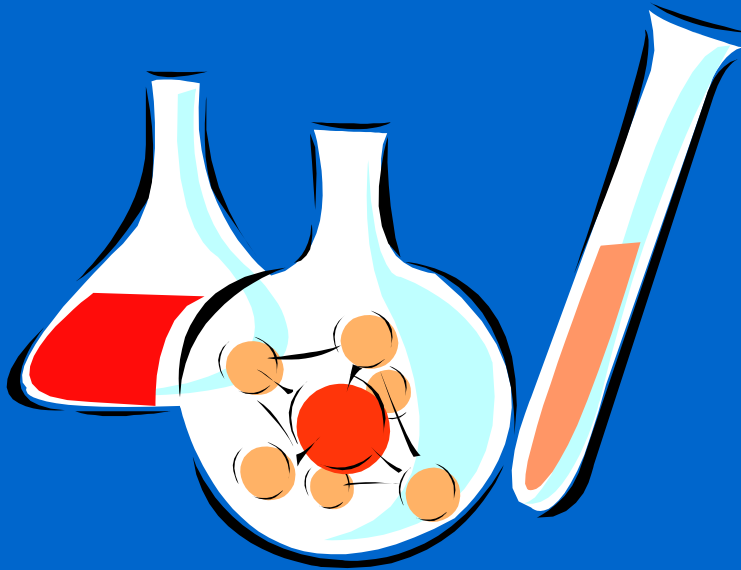
- Processing for Storage
 - Plasma
 - Store @ 1-6C or freeze at -20C if analysis is delayed more than 4 hours
 - Serum
 - Allow specimen to clot completely
 - Store at 4-6C
 - Freeze at -20C if delayed more than 4 hours

Specimen Handling

- Sources of Specimen Variation
 - Biological Factors
 - Posture
 - Change from prone to upright causes a temporary 5-15% reduction in blood volume due to water leaving the intravascular space
 - Tests affected: T.P, albumin, lipids, iron, calcium, and enzymes



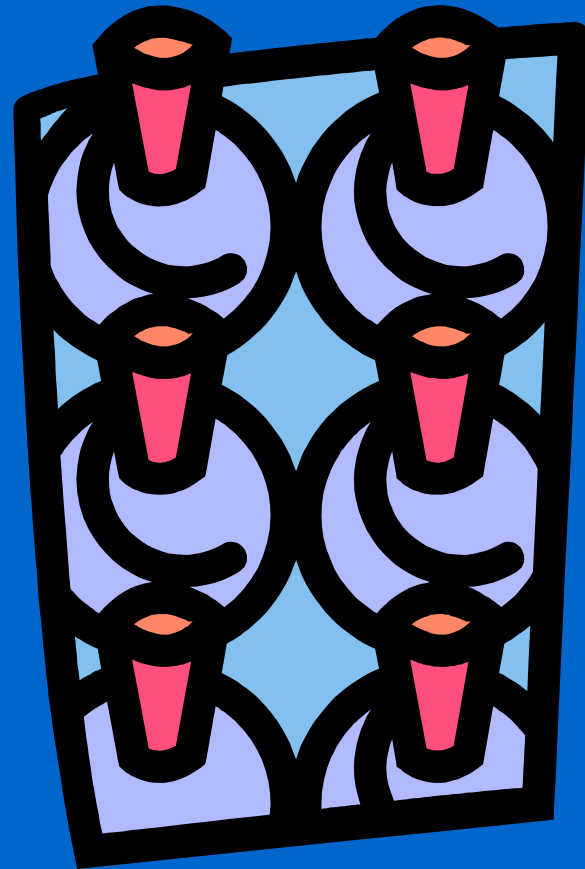
Specimen Handling



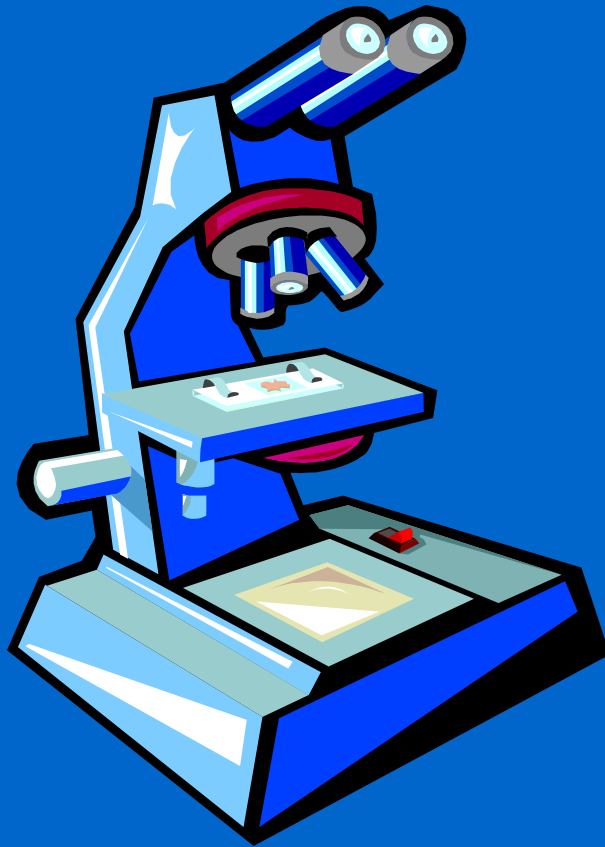
- Immobilization
 - increases body fluid retention
 - causes net decreased serum proteins
 - Increase in urinary nitrogen excretion may also be noted

Specimen Handling

- Exercise
 - Mild exercise results in mild changes in chemistry values
 - Moderate exercise will increase glucose, creatinine and skeletal enzymes
 - Strenuous exercise in non-athletes can cause hypoglycemia



Specimen Handling



- Circadian Variations
 - Cortisol reveal a 50% increase from 0800 to 1600 hours
 - Iron may also change by 50% between 0800 and 1400 hours
 - Estriol, Catecholamines, Corticosteroids, Glucose, and Trig.
 - Best to collect as soon as patient awakens

Specimen Handling

- Food and Stimulants
 - Most significant effect is between fasting and non-fasting states
 - Caffeine increases plasma glucose and triglyceride concentrations
 - Prolonged use can cause slight reductions in cholesterol



Specimen Handling



- Tobacco/Smoking
 - Typically depends on number of cigarettes smoked
 - RBC counts may also increase with habitual use of tobacco products

Specimen Handling

- Alcohol ingestion
 - Effect is proportional to amount ingested
 - Ingestion sufficient to reach intoxication may increase glucose level by 20-50%



Summary

- 3a. Identify steps in specimen collection, preparation, and preservation.